Cloud Services for Longitudinal Electronic Health Record

R.N.V.Jagan Mohan, R.Subbarao

Abstract: Cloud Services are generally accessed using Web services that allow a client application (Service requestor) to request data and calculations to a web server (Service provider) and a service provider to return responses. The client application could be a Web browser is an onsite Web service application, or a Web service application deployed on a cloud platform. The Web Facilitiespermit these end user applications to connectthrough Web servers in a cloud infrastructure that present cloud interfaces with standard Web protocols, usually HTTP. The Web services are a standard framework, which means inter-operating between different Longitudinal Electronic Health Record software applications successively on a variety of platforms. This allows different medical applications to communicate through a Web service and eliminates the dependency on a precise program. In this paper, we proposed an Electronic Health Record medical application running on a Windows Server, which uses a Web service to communicate and interchange data with Java programming request running on anUbuntu Linux server. These web services in cloud computing environments are mainly working on Simple Object Access Protocol (SOAP) and Representation State Transfer (RST). The experiment will be held on vast volume of Longitudinal Electronic Health Records for medical application with the help of service requestor and service provider.Also uses the minimal software reliability of cloud access database for high reliability.

Keywords: Cloud Service, Longitudinal Electronic Health Record, Illustration State Transfer, Simple Object Access Protocol etc.

INTRODUCTION

In connection with high expenditure of the Electronic Health Record mainly in Cloud Computing has enlarged the use of new technologies in present era.Thiswayto revisionof the analysissteadily the revisions conducted in the meadow of cloud computing.Establish at the connection of healthcare and expertise from medical informatics. It is wherever skills in both medical and computer sciences collaborate in an attempt to develop healthcare and patient results. Various medical informatics professionals in amalgam meadow depict on expertise from both disciplines to put knowledge to its finest use in patient care, clinical and research settings. Medical specialists are chore with using information technology to its most benefit in the healthcare engineering. To creating, preserve new-fangled ways for medical facilities and perform to keep electronic health records, improving communication between healthcare providers and amenities to make sure the finest patient results, storing, managing and analyzing data for research, and support with intricate, technology-dependent study. The judgment of this review demonstrated that cloud computing is a wide-rangingknowledge[1]. It comprisesareas for examplesafety and confidentiality, scalability, common performance and inter-operability to carrying outphase and autonomy of Cloud Computing, facility to discover and examination, reducingmistakes and refining the eminence, preparation, elasticity and distributioncapacity. It will be effective for electronic health record. The advanced potential of cloud computing are useful in implementing Electronic Health Records in a diversity of environment. To delivers the broad chances for predictors and earners of healthevidence systems. The area of cloud computing in the concern of Electronic Health Records and it is suggested to use this skill [1]. The acquirement of medicinalfacts from various causes needed anextraordinary amount of data inter-operability. Furthermost,medicinalevidencemethodsaccumulation clinical evidence about patients in nameddesigns. The inter-operability of Electronic Health Record systems help the patient's care in effect and professionally by make easy the repossession and giving out of clinical evidence about the patient from several locality.

In the present research work we explained the concept of Simple Object Access Protocol in section one. The detailed discussion on Representational State Transfer given in section two, the process of Accessing Longitudinal Electronic Health Records is presented in section three of this paper. Section four deals with the experimental results and section five includes the observations and future scope of the research work.

I. SIMPLE OBJECT ACCESS PROTOCOL

It is a procedure for replacing structured data between applications like Service Requestor and Service Provider [6]. It provides a messaging framework that permits medical applications to permitcommunications back and forth in the implementation of web services over a network. SOAP uses Xml for formatting messages that are commonly transferred using HTTP. Simple Object Access Protocol keep an eye on the HTTP appeal and reply message model providing SOAP appeal in a HTTP appeal and SOAP reply in a HTTP reply. SOAP stipulatesthe binding of HTTP header and Xml file so that a Longitudinal Electronic Health Record data sets medical application in one computing system can call a medical application in another computing system and pass it information over HTTP. Being platform and language independent, Simple Object

Revised Manuscript Received on June 01, 2019.

R.N.V.Jagan Mohan, Department of Information Technology, S.R.K.R Engineering College, Bhimavaram-534 204, Andhra Pradesh ., India.
R. Subbarao, Department of Engineering Mathematics, S.R.K.R Engineering College, Bhimavaram-534 204, Andhra Pradesh., India.
rsubbarao9@gmail.com

Access Protocol (SOAP)agree torequestsin succession on several Operating systems, developed with vaious tehnologies, and programming languages to connect with each other [7].

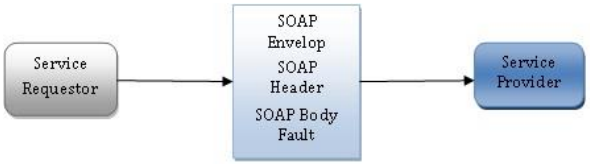

Figure-I. SOAP Message

II. REPRESENTATIONAL STATE TRANSFER

It is a client-server software architectural style for distributed hypermedia systems such as hypertext, audio, video and image. The architectural principles defined in Representational State Transfer are used for developing Web services [8]. A Web service based on Representational State Transfer referred as Representational State Transfer Web service. It makes use of existing Web protocols in commonly HTTP. In the Representational State Transfer architectural style in all objects such as function and data exposed by Web services are treated as resources and are uniquely identified by their Uniform Resource Identifiers. An URL is a string of characters in which commonly provides web address to identify a resource. For simplicity and usability, URLs typically have a directory-like structure. The subscription-id and service-name are the parameters that define the search criteria used by a Web server to find a set of matching resources. There can be almost limitless set of valid URLs that can be used to access resources to the finest levels of granularity.

III. REPOSSESS LONGITUDINAL ELECTRONIC HEALTH RECORDS PROCESS

The Repossess Longitudinal Electronic Health Records medical application process is on illustration State Transfer style emphasizes that the interactions between a client service requestor request and server service provider appeal should use a limited number of methods provided by the HTTP protocol. The Web services allows manipulation like create, read, update and delete of resources by using a set of simple, well-defined HTTP methods commonly PUT, GET, POST and DELETE. The Electronic Health Record resource representation typically reflects the current state of a resource at the time a medical application requests it. When a Web browser gets and displays resource content that constitutes a HTML web page, it is getting a representation of the present state of that resource. Resource Representations in this sense are just snapshots in time. A service requestor performs actions on a resource by using a representation of that resource. A representation has enough information to manipulate a source. . The Electronic Health Record application can negotiate the appropriate representation format right for it. The use of these standard formats allows Web services to be used by medical applications written in different language and running on different computing platforms [3, 4].

This architecture is based on stateless interaction with resources i.e., self-contained request messages. The medical application based Representational State Transfer web service application namely service provider includes within the HTTP request all of the data needed by the server-side component that is service provider to make a response. This eliminates the need to store medical application state at the service provider between requests and retrieving the state while processing a request. The statelessness Web service performance because it offloads the responsibility of maintaining Electronic Health Record medical application state to the requesting application, saving server-side resource utilization. This illustrates both stateful and stateless Web services. In both the cases, a medication application needs to retrieve the content of the next Web page in multipage cloud service information. In case if stateful service, this application requests the next page assuming that the Web services keeps track of where the application leaves off while navigating the service. The Web server stores a variable for the previous page in order to be able to respond to the requests for next. In case of stateless service is the medical application request should include the actual Electronic Health Records page number to retrieve the Electronic Health Records page.

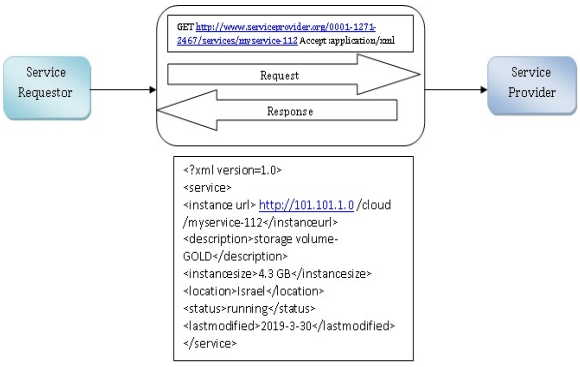

Figure-II: Web services to be used by Longitudinal Electronic Health Records

IV. EXPERIMENTAL RESULTS

The experimental result shows to use Electronic Health Records script to display a web page. To displaying the web page connection to Longitudinal EHR, database example. The web server needed in the samearea as database example with the intention ofit is able to connect to the patterncomplete the private cloudnetwork.

To copy the example hostname we adopt the following steps:

- **Login the Cloud Control Panel.**
- In the top navigation bar, click **Select a Product**
- Select **Databases**
- Click the name of the instance that you want to connect to the load balancer and view the details for the instance.
- Note the region in which this database is located. You must create the load balancer in the same region.
- Copy the hostname string.

To achieve better reliability to deal with R^n and not hire it go down too much from 1.0. Because the large size of Electronic Health Records namely n is predictable, always we try to put R as nearer to 1.0 as possible. The preferredwhole trustworthiness of the system MSR is detained steady to 0.9 or 0.8. Recall that R is the minimal trustworthiness that we can attain for every database access stage. For various values of R, the table-TableII and Iassesses (lowest) n such

that R^n sinks below the desired whole trustworthiness MSR. This is completed by solving n in terms of R and MSR in the experiment of Electronic Health Records [2].

n =log MSR/log R [1]

Table-I: MSR=0.9						
R	0.9	0.99	0.999	0.9999	0.99999	0.999999
N size	500	1500	2500	4000	7500	10000

Table-II: MSR=0.8						
R	0.9	0.99	0.999	0.9999	0.99999	0.999999
N size	1002	3010	5001	8012	15060	221300

By careful observation of above Tables, one can make sure to have high trustworthiness R of 0.999999 for each time accesses the records. We run the difficulty of reducingcompletetrustworthiness MSR below 0.9 or even 0.8. Of course, the number of accesses records is nothing butthe execution of Electronic Health Records which is observed in Table -II as 221300.

V. CONCLUSION

In this research paper, the authors discussed the cloud environment with reference to Longitudinal Electronic Health records. Explained about the concepts of SOAP and RST. A sequence of steps for the process is explained in section IV through an example. It is found that the high reliability R of 0.999999 for every time accesses the records. The risk of dropping complete Minimum Software Reliability (MSR)below 0.9 or even 0.8. The number of accesses records is observed as 221300.

REFERENCES

1. He, Sijin; L. Guo; Y. Guo; C. Wu; M. Ghanem; R. Han (March 2012). Elastic Application Container: A Lightweight Approach for Cloud Resource Provisioning.2012 IEEE 26th International Conference on Advanced Information Networking and Applications (AINA). pp. 15–22. Doi:10.1109AINA.2012.74. ISBN:978-1-4673-0714-7.
2. Mohammad Reza Mesbahi, Amir Masoud Rahmani, Mehdi Hosseinzadeh: Reliability and high availability in cloud computing environments: a reference roadmap,Human-centric Computing and Information Sciences20188:20,https://doi.org/10.1186/s13673-018-0143-8.
3. Michael Miller, "Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online", August 2008.
4. Nouri, Seyed; Han, Li; Srikumar, Venugopal; Wenxia, Guo; MingYun, He; Wenhong, Tian (2019). "Autonomic decentralized elasticity based on a reinforcement learning controller for cloud applications". Future Generation Computer Systems. 94:765–780. Doi:10.1016/ j.future. 2018.11.049.
5. Richard, Adams; Graham, Mann; Valerie, Hobbs (2017). "ISEEK, a tool for high speed, concurrent, distributed forensic data acquisition". Research Online. Doi:10.4225/75/5a838d3b1d27f.
6. https://www.tutorialspoint.com/soap/ what_is_soap.htm.
7. .https://www.guru99.com/soap-simple-object-access-protocol.html
8. Evaluating SOAP for High Performance Business Applications: Real-Time Trading Systems". Tenermerx Pty Ltd University of Technology, Sydney. 2011-11-30. Retrieved 2013-03-14.

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication